

Amendment/Response

Reply to Office Action of July 14, 2003

Amendments to the Claims:

A clean version of the entire set of pending claims (including amendments to the claims, if any) is submitted herewith per 37 CFR 1.121(c)(3). This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. (Currently amended) A method of converting an input beam of non-polarized light having a waist of predetermined height and width in a predetermined plane to an output beam of polarized light having a geometrical extent increased from that of said input beam by no more than a factor of two, said method comprising:

A2 a) positioning a polarizing beam splitter with an input surface having a height and width equal to a predetermined height and width in a predetermined plane, thereby dividing said input beam into perpendicular P and S polarized components;

b) passing said P component light beam through a $\frac{1}{2}$ wave retarder, whereby the light beam exiting said $\frac{1}{2}$ wave retarder has the same polarization as said S component light beam;

c) said $\frac{1}{2}$ wave retarder being spaced from contact with said polarizing beam splitter;

[[c]]d) positioning a turning prism in the path of said S component light beam to direct said S component light beam passed therethrough parallel to and laterally adjacent said P component light beam exiting said $\frac{1}{2}$ wave retarder, said P and S component light beams exiting said $\frac{1}{2}$ wave retarder and said prism jointly forming an output beam having a geometrical extent exceeding that of said input beam by a factor of substantially two; [[and]]

~~d) confining said P and S components by Total Internal Reflection (TIR) in said polarizing beam splitter and said prism, respectively~~ e) said turning prism being spaced from contact with said polarizing beam splitter; and

f) totally internally reflecting said P component in said polarizing beam splitter and said S component in said turning prism;

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2. (Original) The method of claim 1 wherein said TIR is achieved by providing a first air gap between parallel, opposing surfaces of said polarizing beam splitter and said prism, and a second air gap between parallel, opposing surfaces of said polarizing beam splitter and said $\frac{1}{2}$ wave retarder.

3. (Original) The method of claim 1 wherein said TIR is achieved by providing a first layer of low refractive index optical cement between opposing surfaces of said polarizing beam splitter and said prism, and a second layer of low refractive index optical cement between opposing surfaces of said polarizing beam splitter and said $\frac{1}{2}$ wave retarder.

4. (Original) The method of claim 1 wherein said output beam is directed as polarized input light to a liquid crystal based projector.

5. (Original) The method of Claim 1 wherein said beam waist is elliptical and said input surface is rectangular.

6. (Original) The method of Claim 1 wherein said turning prism includes parallel side surfaces and said S component light beam is confined in said turning prism by TIR by said side surfaces.

7. (Currently amended) A non-imaging polarization conversion method comprising:

- a) generating a beam of collimated light having a waist of predetermined height and width in a predetermined plane;
- b) positioning a planer, rectangular input surface of a polarizing beam splitter in said predetermined plane, said surface having a height and width equal to a predetermined height and width, a first portion of said input beam passing through said polarizing beam splitter as a P component light beam and a second portion of said beam being reflected by said polarizing beam splitter as an S component light beam;

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c) positioning a turning prism in the path of said S component light beam to redirect said S component light beam in a path parallel to and laterally adjacent said P component light beam; [[and]]

d) said turning prism being spaced from contact with said polarizing beam splitter; and

[[d]]e) ~~confining said P and S component light beams by Total Internal Reflections (TIR), respectively totally internally reflecting said P component in said polarizing beam splitter and said S component in said turning prism.~~

8. (Original) The method of Claim 7 and further including passing said S component light beam through a $\frac{1}{2}$ wave retarder, thereby placing said S component light beam in phase with said P component light beam.

9. (Original) The method of Claim 8 wherein said TIR is achieved by providing a first air gap between parallel, opposing surfaces of said polarizing beam splitter and said prism, and a second air gap between parallel, opposing surfaces of said polarizing beam splitter and said $\frac{1}{2}$ wave retarder.

10. (Original) The method of Claim 8 wherein said TIR is achieved by providing a first layer of low refractive index optical cement between opposing surfaces of said polarizing beam splitter and said prism, and a second layer of low refractive index optical cement between opposing surfaces of said polarizing beam splitter and said $\frac{1}{2}$ wave retarder.

11. (Original) The method of Claim 8 wherein said waist is elliptical.